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ANNUAL STATISTICAL REPORT

COMMUNICABLE DISEASE CONTROL

MANITOBA HEALTH - 1988

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COMMUNICABLE DISEASE CONTROL DIRECTORATE

INTRODUCTION

The Communicable Disease Control Directorate of Manitoba Health is responsible for the surveillance of communicable diseases in the province. Case reports are received from laboratories and health care professionals, as specified in the Public Health Act. The Directorate assists local health units in managing communicable diseases, and compiles statistical reports of notifiable diseases. Notification is not accepted unless the physician confirms the occurrence of the illness and/or infection. The statistical reports are shared with local health units and the Laboratory Center for Disease Control, Health and Welfare Canada. The following is a summary of the communicable diseases (excluding sexually transmitted diseases) reported in Manitoba in 1988.

1. SUMMARY OF COMMUNICABLE DISEASES

Table One presents a summary of the number of cases of the reportable communicable diseases in 1988, as well as giardiasis and campylobacteriosis. Statistics for 1987 are presented for comparison (figures for giardiasis and campylobacteriosis were not recorded in 1987).

Table Two presents the age and sex distribution of the reported cases for all of the communicable diseases.

Table Three presents the number of cases which occurred in each region in the province in 1988 (see map, Appendix A).

Table Four presents the number of cases for selected diseases by the month of onset.

Table Five presents the crude incidence rate for selected communicable diseases.

Table Six presents the age specific rates for selected communicable diseases.

Table Seven presents the crude incidence rate for selected communicable diseases by health region.

These tables are discussed below.

2. VACCINE PREVENTABLE DISEASES

Manitoba spends approximately two million dollars annually for vaccines recommended for routine use in the province, and maintains a computerized record of the immunizations received by all children born on or after January 1, 1980,

in an effort to reduce the incidence of vaccine preventable diseases. The vaccine preventable diseases include measles, mumps, rubella, diphtheria, pertussis, tetanus, polio, hepatitis B and influenza. Other diseases, such as rabies, are also vaccine preventable but immunization is recommended only for persons who because of special circumstances such as their occupation, have been, or may be, exposed to the disease.

The number of **measles** cases declined from 30 in 1987 to 5 in 1988. No outbreaks were identified. **Mumps** and **rubella** cases were infrequently reported. No cases of congenital rubella syndrome were identified.

No cases of **diphtheria** were identified in 1988, although toxigenic **C.diphtheriae** continues to be isolated from asymptomatic persons. Diphtheria can only be prevented by maintaining high immunization levels in children and adults. Only 5 cases of **pertussis** were reported in 1988, giving a crude incidence rate of only 0.53 per 100,000. However, this is an underestimate since it includes only those cases with laboratory diagnosis, which can be difficult. Manitoba has outbreaks of respiratory illness likely to be pertussis each year.

There were no cases of **tetanus** or **polio** in 1988. If immunization levels remain high, these diseases should remain rare.

No human cases of **rabies** occurred in 1988. Rabies vaccine and rabies immune globulin were provided to 62 persons in 1988, for possible exposure to rabid animals. The majority of the animals were dogs and cats. This compares to 59 persons given rabies immunoprophylaxis in 1987.

Cases of **influenza** occur in Manitoba each winter. Annual immunization against influenza is recommended for persons living in institutions, persons with medical illness who may be more likely to have complications of influenza, and persons who are 65 years of age or older. During the winter of 1987-88, 108 cases were confirmed by the Cadham Provincial Laboratory. Thirty-three were influenza A and 77 were influenza B. Figure 1 depicts the seasonal pattern for laboratory confirmed cases of influenza for the winter of 1987/88. Thirty-six percent of cases were in persons aged 15 to 55 years; 17% were in persons 56 years of age or older. Half of the cases occurred in Winnipeg.

In 1988, 61 acute cases of **hepatitis B** were reported. The crude incidence rate was 5.4 per 100,000, reflecting Manitoba's status as an area of low endemicity for hepatitis B. The age specific rate was highest in adults (aged 20-39 years).

The likely source of hepatitis B infection is given below:

	NUMBER OF CASES	
MODE OF TRANSMISSION	**1987**	**1988**
INTRAVENOUS DRUG USE	22	19
HOMOSEXUAL CONTACT	3	1
HETEROSEXUAL CONTACT	15	13
HEALTH CARE WORKER	0	1
OTHER	3	3
POST TRANSFUSION	0	1
UNKNOWN	12	21
UNABLE TO LOCATE	13	2
TOTAL	68	61

Hepatitis B continues to occur in persons who use intravenous drugs, with no decrease in the number of cases over the past 4 years. This is the likely reason for the peak incidence of hepatitis B in the core area of Winnipeg. The occurrence of cases in heterosexuals may be indicative of a lack of impact of public education regarding safer sex practices. The number of cases in homosexuals continues to decline.

Hepatitis B vaccine is provided to persons at acute risk of exposure to the virus. In 1988, vaccine and HBIG were provided to 63 babies born to mothers who were carriers of hepatitis B surface antigen. This compares to 54 such babies in 1987. All of the babies completed the three dose series of hepatitis B vaccine.

3. ENTERIC DISEASES

The following are included in the enteric (gastrointestinal) diseases: amebiasis, campylobacteriosis, verotoxigenic E.coli infections, giardiasis, hepatitis A, salmonellosis, shigellosis, typhoid and paratyphoid.

a) Salmonellosis: Figure 2

During 1988, 210 cases of salmonellosis were reported in Manitoba. This compares to 211 for 1987 and 219 for 1986. Incidence is thus considered static, which follows the national trend. The crude incidence rate was 18.7 per 100,000, which is lower than the national or other provincial rates. A factor of 350 is normally used to estimate the actual number of cases from the number reported, i.e., as many as 73,500 cases may have occurred in 1988.

The distribution of cases by health region and age and sex can be seen in the Tables. Age specific rates indicate increased liklihood of infection in children less than 5 years of age. The average case age dropped 2.8 years to 27 years. An increased proportion of cases were noted in children under the age of two (from 14.5% in 1987 to 19.1% in 1988), and in adults aged 20 to 30 years (from 19.9% to 23.7%). The peak incidence of cases was in July and August (Figure 2). Crude incidence rate varied from health region to health region, but was highest in the rural regions of Norman and Parklands.

Forty serotypes were reported. Three serotypes accounted for 40% of the cases:

HADAR	39 CASES	18.6%
TYPHIMURIUM	24 CASES	11.4%
ENTERITIDIS	25 CASES	11.9%

Poultry is the primary reservoir for these serotypes.

The complete listing of serotypes is as follows:

AGONA	7	INFANTIS	7
ANATUM	4	ISTANBUL	1
BERTA	3	JAVA	1
BLEGDAM	2	JAVIANA	1
BLOCKLEY	1	KOTTBUS	1
BOVIS MORBIFICANS	9	LITCHFIELD	1
DERBY	4	LONDON	2
ENTERITIDIS	25	MBANDAKA	1
HAART	1	MEUNCHEN	14
HADAR	39	MONTEVIDEO	5
HAVANA	1	NEINSTEDTEN	1
HEIDELBERG	5	NEWPORT	4
OHIO	5	THOMPSON	10
PAKISTAN	1	TYPHIMURIUM	24
PANAMA	1	UGANDA	1
ST.PAUL	4	VIRCHOW	1
SCHWARTZENGRUND	7	VIRGINIA	1
SHUBAR	2	WELTEVREDEN	1
STANLEY	3	UNTYPEABLE	9

Infection was epidemiologically linked to:

1. Travel abroad: This was a factor in 32 cases (14.6%), up slightly from 1987. Areas visited were Mexico (14 cases), Jamaica (5 cases), Dominican Republic (3 cases), South America (3 cases), USA (2 cases), and single cases from Central America, Thailand, Portugal, the Philippines and India.
2. Raw milk consumption was implicated in 12 cases including 5 in one family. This compare with a single case in 1987.

3. Poultry plant workers were involved in 2 cases.

4. Errors in food preparation in the home were reported to be a factor in 4 cases.

5. Food prepared in food service establishments was implicated in 5 cases.

6. Various other factors (e.g. 3 cases in a group home) were implicated.

Typhoid and Paratyphoid

Three cases of typhoid and two cases of paratyphoid were identified. A source for one case of paratyphoid could not be identified, but all others were from travel or recent immigrants from India.

PARATYPHI A	2	TYPHI	3

b) Campylobacteriosis: Figure 2

Campylobacteriosis is not yet a reportable disease. However, 1988 was the first full year in which all campylobacter laboratory isolations were reported and investigated. The epidemiology of campylobacteriosis is similar to that of salmonellosis, including frequent involvement of raw milk.

During 1988, 175 cases were confirmed in Manitoba. The crude rate was 15.6 cases per 100,000, much lower than in other jurisdictions but second only to giardiasis and salmonellosis in Manitoba. Incidence was highest in rural health regions. The highest age specific incidence rate was in children <5 years of age. This may be related to the consumption of raw milk. The campylobacter isolations were primarily **C.jejuni**, with the remaining cases due to **C.coli**.

The following epidemiologic factors were identified during case investigation:

1. Raw milk consumption: 27 cases. Two cases occurred in a summer camp, where an additional 8 suspected cases were identified.

2. Travel abroad: 9 cases, two each from Dominican Republic, Mexico, Jamaica, and the Far East, and one from Venezuela.

3. Meat plant workers: 4 cases.

4. Animal contact by children: 4 cases.

5. Poultry preparation in the home: 3 cases.

These factors are similar to those for salmonellosis.

c) Verotoxigenic E.coli: Figure 3

1988 was the first year in which infections due to **verotoxigenic E.coli** were reported in the province, although the organism has been reported in other parts of Canada. The source is thought to be meat, especially undercooked hamburger. Fifty-seven cases were reported in 1988, with peak incidence in July and August. All areas of the province were affected although the rate was highest in suburban Winnipeg. Highest attack rates were in the first and eighth decades of life; however most cases were less than 30 years of age. Sixty percent of cases were admitted to hospital. There were no institutional outbreaks, however, four family clusters were identified. Five cases of hemolytic uremic syndrome (HUS) were reported in 1988, all in children less than 10 years of age. Infection with VTEC was linked directly to two of these cases, while the other three had a history of bloody diarrhea prior to the onset of HUS. No source for the infections could be established, and VTEC was not demonstrated in meat samples in 1988.

d) Amebiasis

Entamoeba histolytica is the cause of amebiasis, a protozoan infection which is usually transmitted from person to person by fecal oral route. A total of 40 cases were reported in 1988, compared to 34 in 1987. No case clusters were identified. The age specific rate was highest in young children, and in the Norman and Parklands health regions.

e) Hepatitis A

This viral infection is spread by the fecal oral route. Epidemics occur every few years in areas of Manitoba with poor water and sanitation. The total of 65 cases in 1988 did not constitute an epidemic year, with a crude incidence rate of only 5.8 per 100,000. Hepatitis A is underreported since most cases occur in young children who may have mild symptoms without jaundice. By far the highest crude incidence rate was in Norman region.

f) Shigellosis: Figure 4

This bacterial infection is transmitted in the same manner as hepatitis A and has in the past caused outbreaks in the province. In 1988, forty-one cases were identifed. There were no major outbreaks. As with other enteric diseases, age specific incidence was highest in young children. The higest crude incidence rates were in northern health regions. The Shigella species identified were as follows:

S.dysenteriae:	1 (source: Mexico)
S.flexneri :	12
S.sonnei :	25
Not recorded :	3

Infection was associated with:

Living on a reserve:		5 cases (2 reserves)
Travel	:	26 cases
Mexico	:	14 cases
Caribbean	:	2 cases
Israel	:	3 cases
India/Sri Lanka	:	3 cases
Other	:	4 cases
Outbreaks	:	3 cases
Unknown	:	1 case
No information	:	6

g) Giardiasis: Figure 4

Laboratories report the identification of giardia, although giardiasis is not yet a notifiable disease. Two hundred and twenty-nine cases were reported in 1988. The crude incidence rate was the highest of all the enteric diseases (20.4 per 100,000). Young children had the highest age specific incidence. The majority of cases were reported from the western and southern half of the province, especially the rural areas. Cases occured throughout the year, with peak incidence from July to November. Several family clusters were identified, although in most cases a source could not be identified.

4. DISEASES OF OTHER SYSTEMS

a) Bacterial meningitis caused by H.influenzae b

In 1988, meningitis was the only notifiable disease caused by **H.influenzae b**, although this organism is associated with septic arthritis, bacteremia and epiglottitis. A total of 15 cases of meningitis were reported. All were in children <5 years of age. All regions of the province were affected. None of the cases were linked epidemiologically.

b) Bacterial meningitis caused by S.pneumonia

This organism is the most frequent cause of bacterial meningitis in adults. Seven cases were reported in 1988.

c) Bacterial meningitis caused by other organisms

Two cases of bacterial meningitis caused by other organisms were reported, one in which **E.coli** was isolated from the CSF and one in which streptococci were isolated from the CSF.

d) Meningococcal infections

Fourteen cases of invasive meningococcal disease were reported. The majority of these were meningitis. The very young and the very old were most often affected. No seasonal pattern was evident, and cases were reported from most health regions.

e) Meningitis/encephalitis caused by viral infections

A total of 23 cases of viral meningitis/encephalitis were reported. Coxsackie virus was isolated from the CSF in four cases, Herpes virus from one case and ECHO virus from one case. In the remainder of cases the virus was not identified.

f) Tuberculosis

A complete annual report for tuberculosis control is available from the Central Tuberculosis Registry. In summary, 111 cases were reported, a decline from 125 in 1987. Age specific incidence rates increase with age, peaking in those aged 60 and over. The highest crude incidence was in Thompson health region and the inner city area of Winnipeg.

5. RARE COMMUNICABLE DISEASES

Legionellosis, **brucellosis**, **leprosy**, **malaria**, **listeriosis**, **psittacosis**, **trichinosis** and **tularemia** remain rare diseases in Manitoba. No cases of **Western Equine Encephalitis** were reported.

Although 5 cases of **Lyme Disease** where tentatively identified in the province, the causative organism (**Borrelia burgdorferi**) and the usual tick vector (**Ixodes dammini**) remain elusive. Further investigation is required to determine the incidence (if any) of Lyme Disease in Manitoba.

TABLES

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TABLE ONE SUMMARY OF COMMUNICABLE DISEASES IN MANITOBA

DISEASE	YEAR 1987	1988
AMEBIASIS	34	40
BOTULISM	-	-
BRUCELLOSIS	-	1
CAMPYLOBACTERIOSIS	NR	175
CHOLERA	-	-
DIPHTHERIA	1	-
E.COLI, VEROTOXIN-PRODUCING	-	57
GIARDIASIS	NR	229
HAEMOPHILUS INFLUENZAE B	24	15
HEPATITIS A	158	65
HEPATITIS B	68	61
HEPATITIS, NON-A, NON-B, VIRAL	1	1
HERPES, NEONATAL	-	-
LEGIONELLOSIS	10	2
LEPROSY (HANSEN'S DISEASE)	4	6
LISTERIOSIS	2	2
LYME DISEASE	NR	5
MALARIA	22	2
MEASLES	30	5
MENINGITIS, PNEUMOCOCCAL	12	7
MENINGITIS, BACTERIAL, OTHER	4	2
MENINGITIS/ENCEPHALITIS, VIRAL	39	23
MENINGOCOCCAL DISEASE	14	14
MUMPS	18	7
PARATYPHOID FEVER	3	2
PERTUSSIS	28	6
PLAGUE	-	-
POLIOMYELITIS	-	-
PSITTACOSIS/ORNITHOSIS	1	2
Q FEVER	-	-
RABIES (HUMAN)	-	-
RUBELLA	7	6
RUBELLA, CONGENITAL SYNDROME	-	-
SALMONELLOSIS (ALL TYPES)	211	210
SHIGELLOSIS	33	41
TETANUS	-	-
TRICHINOSIS	-	1
TUBERCULOSIS	125	111
TULAREMIA	2	3
TYPHOID FEVER	-	3
YELLOW FEVER	-	-
WESTERN EQUINE ENCEPHALITIS	-	-

Table Two

Age And Sex Distribution

Communicable Diseases In Manitoba 1988

	N/R	< 1		1 - 4		5 - 9		10-14		15-19		20-24		25-29		30-39		40-59		> 60	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Amebiasis				2	6	3		2				3		2	2	5	1	6	1	3	4
Botulism																					
Brucellosis																1					
Campylobacterioses	3	3	1	25	19	9	3	11	2	7	2	9	7	15	11	6	10	8	10	7	7
Cholera																					
Diphtheria																					
E.coli,verotoxin-producing	1	1	2	4	8	3	3	1	1		7	2	4		3	1	3	2	3	3	5
Giardiasis		17	16	22	18	13	13	7	12	8	7	4	9	15	5	13	17	12	12	7	2
Haemophilus Influenzae B		2	2	5	6																
Hepatitis A, Viral				2	7	10	10	1	9	2	4	1	2	3	2	4	2	1	4		1
Hepatitis B, Viral	1							1		4	6	8	9	7	4	9	4	3	1	3	1
Hepatitis Non-a Non-b, Viral																	1				
Herpes, Neonatal																					
Legionellosis																					2
Leprosy (Hansen's Disease)						1						2		1	1			1			
Listeriosis																			1	1	
Lyme Disease																					
Malaria									1									1			
Measles				1	1			1		1					1						
Meningitis, Pneumococcal				1	1														1	1	3
Meningitis, Bacterial, Other			1																		1
Meningitis/encephalitis, Viral		6	2	1	1	2				2			2	2		1	2		2		
Meningococcal Disease		1	1	2	2					1		1						1	1	1	3
Mumps							1			1						1	1	1	2		
Paratyphoid Fever											1	1									
Pertussis		2		2	2																
Plague																					
Poliomyelitis																					
Psittacosis/ornithosis													1					1			
Q Fever																					
Rabies (Human)																					
Rubella							1	1	1	1			1						1		
Rubella, Congenital Syndrome																					
Salmonellosis (All Types)	2	12	7	12	25	4	3	7	1	3	3	13	20	12	4	15	17	8	9	13	20
Shigellosis	1			3	3	1		2	3		2	2	4	3	4	3	2	2	4	1	1
Tetanus																					
Trichinosis																1					
Tuberculosis					2		2	1	2	3	2	5	5	8	2	12	3	13	12	20	19
Tularemia				1								1						1			
Typhoid Fever														1		1		1			
Yellow Fever																					

NR - not recorded

Table Three

REGIONAL DISTRIBUTION
COMMUNICABLE DISEASES 1988

	N/R	NORMAN	PARKLANDS	WESTMAN	CENTRAL	INTERLAKE	EASTMAN	THOMPSON	WINNIPEG INNER CITY	WINNIPEG NORTH	WINNIPEG SOUTH	WINNIPEG WEST CENTRAL
Amebiasis		5	5	1	5	1	4	2	8	3	2	4
Botulism												
Brucellosis										1		
Campylobacterioses		2	17	30	29	7	21		17	16	29	7
Cholera												
Diphtheria												
E.Coli,Verotoxin-producing	1	1	1	2	3	3	5	2	7	13	16	3
Giardiasis		7	37	37	32	7	16	9	48	16	9	11
Haemophilus Influenzae B			1	2	1	1	3	1	2	1	3	
Hepatitis A, viral		11	3	21	3		3	1	16	1	6	
Hepatitis B, viral		1	2	1	4			1	38	2	11	1
Hepatitis non-A non-B, viral									1			
Herpes, Neonatal												
Legionellosis									2			
Leprosy (Hansen's Disease)	1								5			
Listeriosis				1					1			
Lyme Disease												
Malaria				1					1			
Measles								1	2	1	1	
Meningitis, Pneumococcal					2			1	2	1	1	
Meningitis, Bacterial, other											1	1
Meningitis/encephalitis, viral	1		1	3	1	3		1	5	3	3	2
Meningococcal disease		2	2	2			2	1	1		3	1
Mumps						1			3	1	1	1
Paratyphoid Fever						1			1			
Pertussis				4	2							
Plague												
Poliomyelitis												
Psittacosis/ornithosis											1	1
Q Fever												
Rabies (Humen)												
Rubella		1		1		1	1	1	1			
Rubella, Congenital Syndrome												
Salmonellosis (All Types)	1	10	22	21	24	13	10	5	46	24	27	7
Shigellosis		2	1	5		1		6	9	6	7	4
Tetanus												
Trichinosis								1				
Tuberculosis		2		8	5	6	3	16	52	10	8	1
Tularemia			1			1	1					
Typhoid Fever									3			
Yellow Fever												

Table Four

1988 MONTH BY DATE OF ONSET
SELECTED COMMUNICABLE DISEASES

	1987									1988											
	N/R	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Amebiasis	5				1	1	1	2	1	9	3	4	3	2	1	1	3	2		1	
Campylobacterioses	2									5	9	8	9	7	15	11	35	27	24	13	10
E.Coli,Verotoxin-producing															3	23	15	5	6	5	
Giardiasis		(9)	(15)	(20)	(29)	(26)	(19)	(14)	(14)	11	13	14	8	7	19	21	27	41	23	30	15
Haemophilus Influenzae B				1		1		2	1				3	2	1			1	3		
Hepatitis A, viral						2		2	13	10	7	6	6	7	1	2	3	3	1	2	
Hepatitis B, viral	2				1		2	4	3	5	12	6	3	3	3	10	2	3	1	1	
Meningococcal disease	1										2	1	2	2	1	1	1	1	1	1	
Salmonellosis (All Types)	3				1		4	7	5	23	11	14	14	14	20	23	25	22	13	11	
Shigellosis	3					1		1	4	2	6	5	3	1		1	7	3	4		

N/R - not recorded

1987 figures in brackets have not been included in the 1987 Annual Report

Table Seven

CRUDE INCIDENCE RATE, SELECTED COMMUNICABLE DISEASES,
BY HEALTH REGION, 1988

RATE PER 100,000

DISEASE	HEALTH REGION								
	THOMPSON	WESTMAN	WPG SUB-DIV	INNER CITY	CENTRAL	EASTMAN	INTERLAKE	NORMAN	PARKLAND
AMEBIASIS	4.8	.8	2.2	3.6	5.2	4.4	1.3	19.9	10.2
CAMPYLOBACTERIOSIS	-	25.1	12.7	7.7	30.3	23.0	9.4	8.0	34.8
E.COLI.VEROTOXIN PROD.	4.8	1.7	7.8	3.2	3.1	5.5	4.0	4.0	2.1
GIARDIASIS	21.7	30.9	8.8	21.8	33.3	17.5	9.4	27.9	75.7
HAEMOPHILUS INFLUENZ.B	2.4	1.7	1.0	.9	1.1	3.3	1.3	-	2.1
HEPATITIS A	2.4	17.5	1.7	7.3	3.1	3.3	-	43.9	6.1
HEPATITIS B	2.4	.8	3.4	17.2	4.2	-	-	4.0	4.1
MEASLES	2.4	-	.5	.9	-	-	-	-	-
MENINGOCOCCAL DISEASE	2.4	1.7	1.0	.5	-	2.2	-	7.8	4.1
PERTUSSIS	-	3.3	-	-	2.1	-	-	-	-
SALMONELLOSIS	12.1	17.5	14.2	20.8	25.1	10.9	17.5	40.0	45.0
SHIGELLOSIS	14.5	4.2	4.2	4.1	-	-	1.3	8.0	2.1
TUBERCULOSIS	38.6	6.7	4.7	24.0	5.2	3.3	8.1	8.0	-

FIGURES

FIGURE 1. INFLUENZA A AND B, BY MONTH OF ONSET, JAN-MAY 1988

FIGURE 2. SALMONELLOSIS AND CAMPYLOBACTERIOSIS, BY MONTH OF ONSET, 1988

FIGURE 3. VEROTOXIGENIC E.COLI, BY MONTH OF ONSET, 1988

FIGURE 4. GIARDIASIS AND SHIGELLOSIS, BY MONTH OF ONSET, 1988

APPENDIX A: REGIONAL MAP, MANITOBA

APPENDIX B: MANITOBA POPULATION DISTRIBUTION

Figure 1

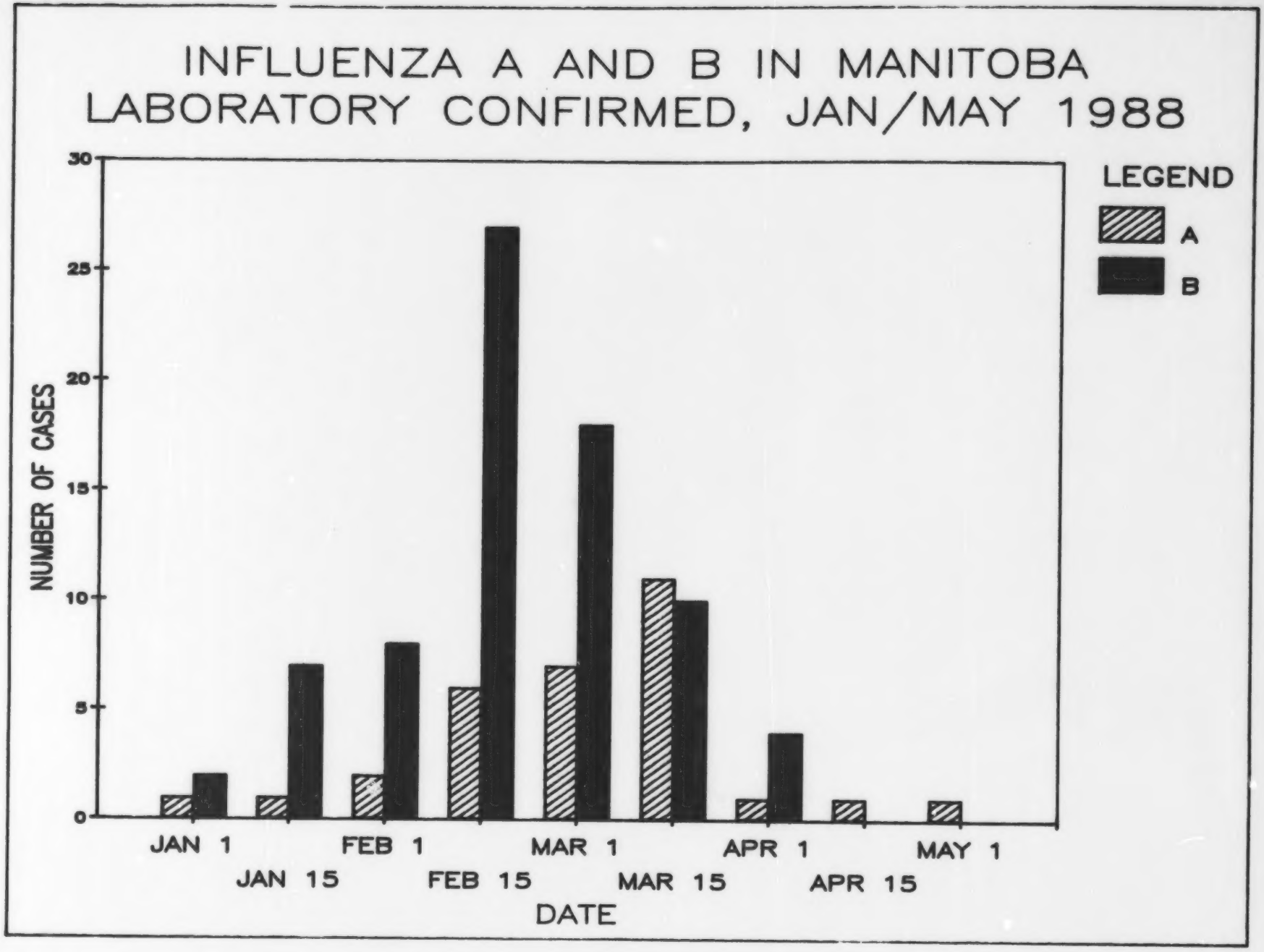

INFLUENZA A AND B IN MANITOBA
LABORATORY CONFIRMED, JAN/MAY 1988
LEGEND
A
B
NUMBER OF CASES
30
25
20
15
10
5
0
JAN 1
JAN 15
FEB 1
FEB 15
MAR 1
MAR 15
APR 1
APR 15
MAY 1
DATE

Figure 2

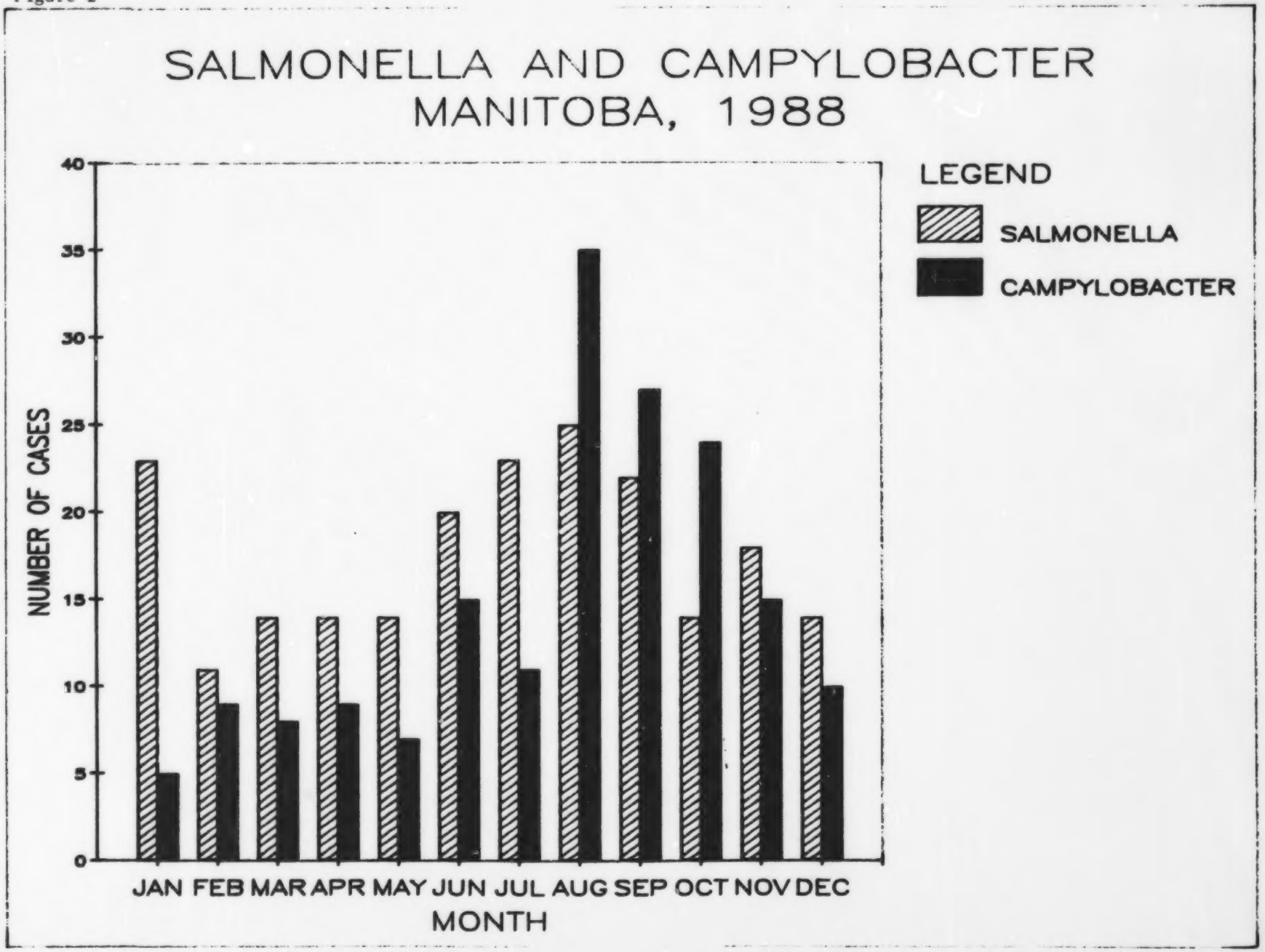

SALMONELLA AND CAMPYLOBACTER
MANITOBA, 1988
LEGEND
SALMONELLA
CAMPYLOBACTER
NUMBER OF CASES
0
5
10
15
20
25
30
35
40
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
MONTH

Figure 3

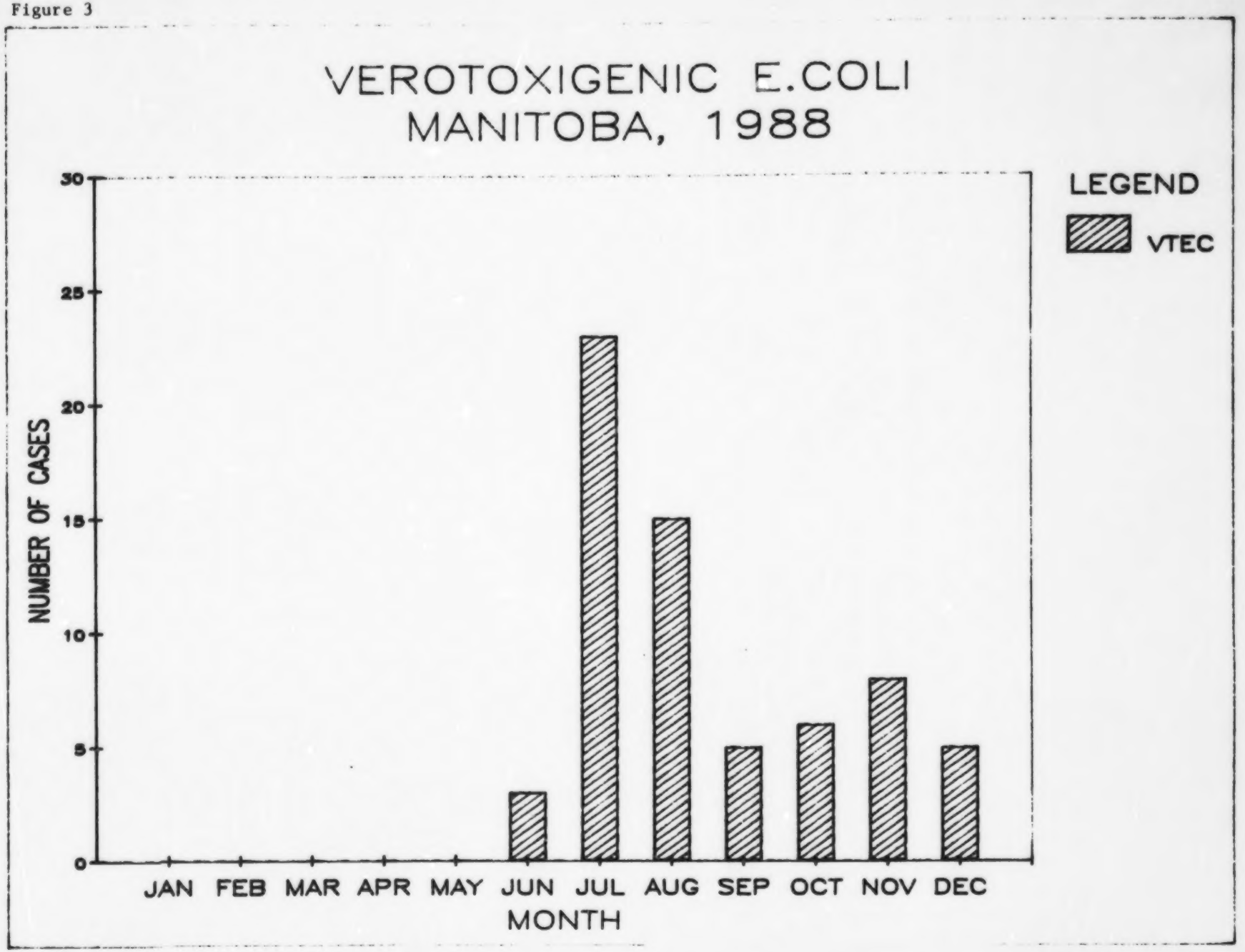
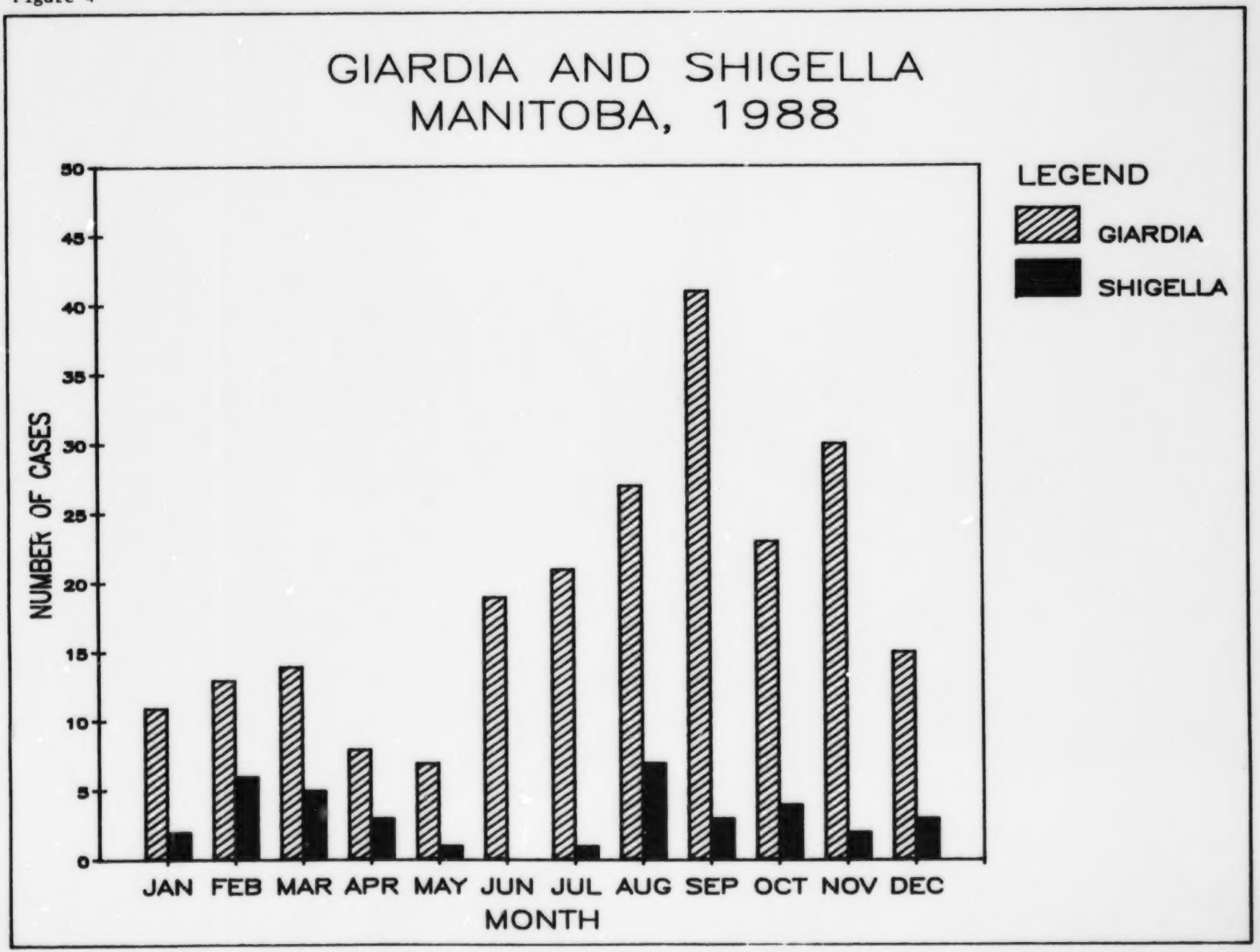

VEROTOXIGENIC E.COLI
MANITOBA, 1988
LEGEND
VTEC
NUMBER OF CASES
30
25
20
15
10
5
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
MONTH

Figure 4


GIARDIA AND SHIGELLA
MANITOBA, 1988
LEGEND
GIARDIA
SHIGELLA
NUMBER OF CASES
0
5
10
15
20
25
30
35
40
45
50
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
MONTH

Appendix A

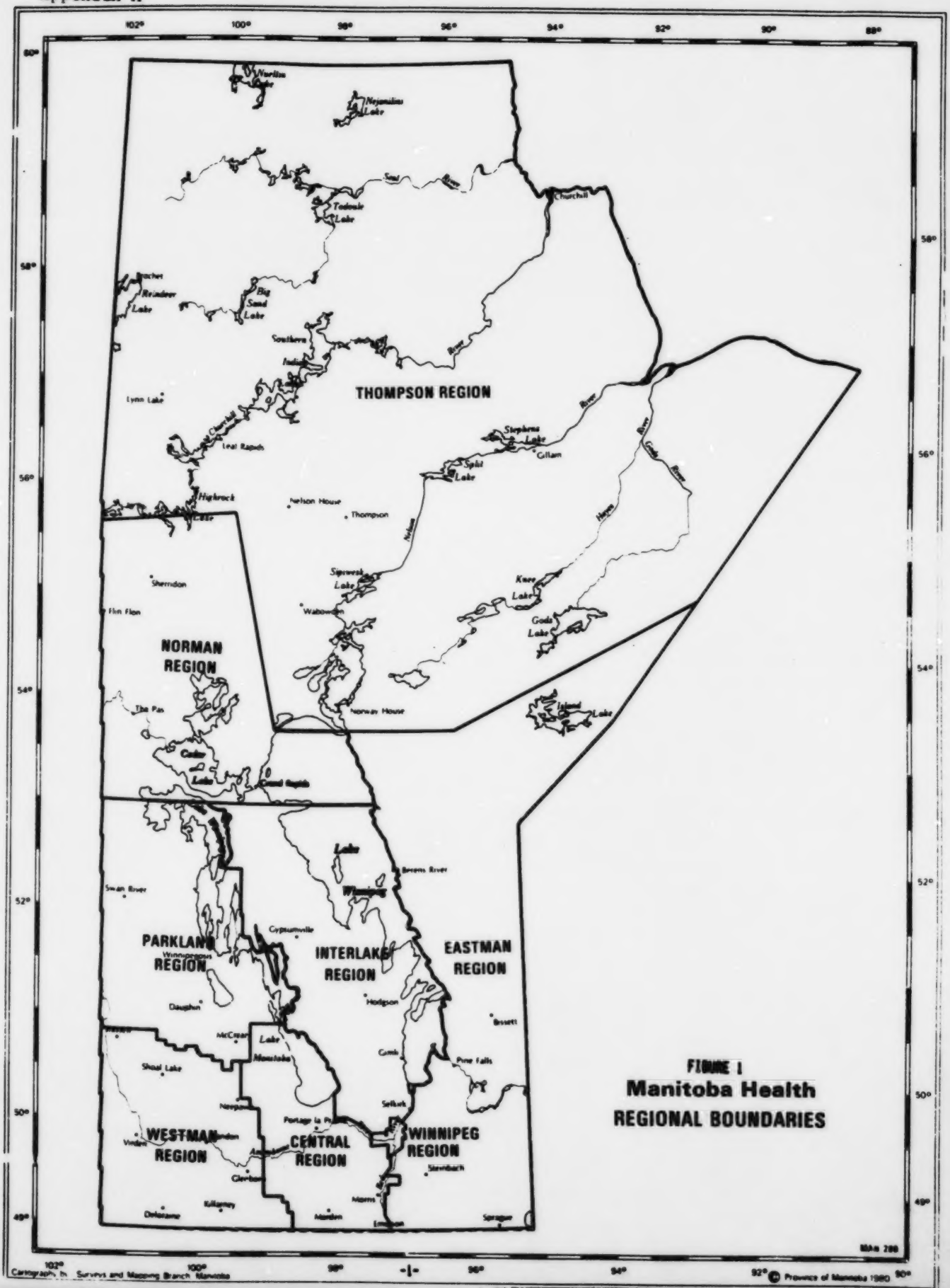


FIGURE 1

Manitoba Health

REGIONAL BOUNDARIES

Health Services Commission

A44R724 POPULATION BY AGE AND SEX
TOTAL MANITOBA POPULATION

TOTAL POPULATION	MALE	FEMALE
1,125,414	556,735	568,679

FILE STATUS AS AT: 88 06 01 | REPORT PRODUCED: 88 12 03 | PAGE: 304

AGE GROUP	TOTAL PER AGE GROUP	MALE	FEMALE
<1	16,906	8,605	8,300
1	17,282	8,878	8,404
2	17,304	8,857	8,447
3	17,157	8,796	8,361
4	16,962	8,725	8,237
SUB TOTAL	85,611	43,862	41,749
5	16,807	8,634	8,173
6	16,619	8,585	8,034
7	16,568	8,514	8,054
8	16,289	8,432	7,857
9	16,208	8,238	7,970
SUB TOTAL	82,491	42,403	40,088
10	16,287	8,325	7,962
11	16,063	8,194	7,869
12	16,668	8,612	8,056
13	16,719	8,583	8,136
14	16,562	8,545	8,017
SUB TOTAL	82,299	42,259	40,040
15	16,709	8,618	8,091
16	17,168	8,770	8,398
17	17,876	9,081	8,795
18	17,430	8,822	8,608
19	17,327	8,857	8,470
SUB TOTAL	86,510	44,148	42,362
20	16,927	8,589	8,338
21	17,337	8,600	8,737
22	18,433	9,210	9,223
23	19,905	10,073	9,832
24	20,609	10,366	10,243
SUB TOTAL	93,211	46,838	46,373
25	20,935	10,433	10,502
26	20,954	10,597	10,357
27	20,743	10,570	10,173
28	20,576	10,522	10,054
29	19,790	10,011	9,779
SUB TOTAL	102,998	52,133	50,865
30	19,619	9,969	9,650
31	19,500	9,818	9,682
32	18,977	9,670	9,307
33	19,006	9,564	9,442
34	18,547	9,310	9,237
SUB TOTAL	95,649	48,331	47,318
35	17,600	8,707	8,893
36	17,162	8,718	8,444
37	16,597	8,214	8,383
38	16,349	8,317	8,032
39	16,021	8,078	7,943
SUB TOTAL	83,729	42,034	41,695
40	16,152	8,059	8,093
41	16,237	8,246	7,991
42	13,457	6,696	6,761
43	12,703	6,526	6,177
44	12,615	6,436	6,179
SUB TOTAL	71,164	35,963	35,201
45	12,321	6,124	6,197
46	11,230	5,633	5,597
47	11,073	5,516	5,557
48	10,535	5,286	5,249
49	10,235	5,122	5,113
SUB TOTAL	55,394	27,681	27,713
50	10,119	5,098	5,021
51	9,634	4,815	4,819
52	9,868	4,880	4,986
53	9,670	4,892	4,778
54	9,437	4,796	4,641
SUB TOTAL	48,728	24,481	24,247
55	9,923	5,002	4,921
56	9,893	4,905	4,988
57	9,619	4,720	4,899
58	9,945	4,919	5,026
59	9,570	4,615	4,955
SUB TOTAL	48,950	24,161	24,789
60	9,800	4,775	5,025
61	9,562	4,618	4,944
62	9,587	4,527	5,060
63	9,742	4,575	5,167
64	9,610	4,461	5,149
SUB TOTAL	48,301	22,956	25,345
65	9,669	4,424	5,245
66	9,511	4,275	5,236
67	9,106	4,080	5,026
68	8,824	4,035	4,789
69	7,946	3,646	4,300
SUB TOTAL	45,056	20,460	24,596
70	7,584	3,440	4,144
71	7,486	3,376	4,110
72	7,286	3,198	4,088
73	7,563	3,346	4,217
74	6,974	3,070	3,904
SUB TOTAL	36,893	16,430	20,463
75	6,498	2,787	3,711
76	5,856	2,499	3,357
77	5,487	2,297	3,190
78	5,115	2,139	2,976
79	4,509	1,799	2,710
SUB TOTAL	27,465	11,521	15,944
80	4,252	1,708	2,544
81	3,789	1,449	2,340
82	3,514	1,345	2,169
83	3,066	1,117	1,949
84	2,758	1,053	1,705
SUB TOTAL	17,379	6,672	10,707
85	2,403	902	1,501
86	2,074	766	1,308
87	1,727	561	1,166
88	1,465	471	994
89	1,213	391	822
SUB TOTAL	8,882	3,091	5,791
90	1,004	279	725
91	865	246	619
92	713	208	505
93	558	151	407
94	388	96	292
SUB TOTAL	3,528	980	2,548
95	340	91	249
96	230	62	168
97	173	43	130
98	115	37	78
99	155	47	108
SUB TOTAL	1,013	280	733
100	54	15	39
101	35	15	20
102	30	8	22
103	18	3	15
104	10	2	8
SUB TOTAL	147	43	104
105	3	1	2
106	2	1	1
107	4	2	2
108	4	2	2
109	1	1	0
SUB TOTAL	14	7	7
110	0	0	0
111	0	0	0
112	0	0	0
113	2	1	1
114	0	0	0
SUB TOTAL	2	1	1
115+	0	0	0
TOTAL POPULATION	1,125,414	MALE 556,735	FEMALE 568,679

SELECTED ANALYSES

AGE GROUP	TOTAL PER AGE GROUP	MALE	FEMALE
0 - 17	302,154	154,993	147,161
18 - 64	682,881	342,257	340,624
65 - 79	109,414	48,411	61,003
80+	30,965	11,074	19,891

AGE GROUP	TOTAL PER AGE GROUP	MALE	FEMALE
65+	140,379	59,485	80,894
70+	95,323	39,025	56,298
85+	13,586	4,402	9,184
90+	4,704	1,311	3,393

AGE GROUP	TOTAL PER AGE GROUP	MALE	FEMALE
0 - 14	250,401	128,524	121,877
15 - 24	179,721	90,986	88,735
25 - 34	198,647	100,464	98,183
35 - 44	154,893	77,997	76,896
45 - 54	104,122	52,162	51,960
55 - 64	97,251	47,117	50,134
65 - 74	81,949	36,890	45,059
75+	58,430	22,595	35,835

FORM M.H.S.C. 13.040.1743.R 1984

END OF REPORT